

Spectral Analysis of Surface Waves (2A)

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2D FT seismic example (1)

Power Spectra

$$G_{XX} = X^*(f) \cdot X(f)$$

$$G_{YY} = Y^*(f) \cdot Y(f)$$

Cross Spectrum

$$G_{XY} = X^*(f) \cdot Y(f)$$

$$G_{XY} = \frac{1}{N} \sum_{i=1}^N X^*(f) \cdot Y_i(f)$$

$$\Phi(f) = \tan^{-1} \left(\frac{\Im(G_{XY})}{\Re(G_{XY})} \right)$$

Coherence Function

$$\gamma^2(f) = \frac{|G_{XY}(f)|^2}{G_{XX}(f) \cdot G_{YY}(f)}$$

References

[1] <http://en.wikipedia.org/>